

What is claimed is:

1. A variable output RF power amplifier comprising:
voltage regulator means for producing a specified voltage within a range of voltages in accordance with a control signal for performing at least one of level control, burst control, and modulation; and
a power amplifier including a final amplification stage having the specified voltage as a supply voltage and having a drive signal causing the final amplification stage to be driven repeatedly between two states, a hard-on state and a hard-off state, without operating the amplifier in a linear operating region for an appreciable percentage of time;
wherein the amplifier is controlled without continuous or frequent feedback adjustment.
2. The apparatus of Claim 1, wherein the voltage regulator means comprises a first switch-mode converter stage and a second linear regulator stage.
3. The apparatus of Claim 2, wherein the switch-mode converter stage provides coarse level control and the linear regulator stage provides fine ramp control.
4. The apparatus of Claim 3, wherein the power amplifier is hard-limited.
5. The apparatus of Claim 4, wherein the power amplifier is a saturated amplifier selected from the group of Class A, Class AB and Class C amplifiers.
6. The apparatus of Claim 3, wherein the power amplifier is a switch-mode amplifier.

7. The apparatus of Claim 3, wherein the power amplifier is a Class C amplifier.

8. The apparatus of Claim 2, wherein the switch-mode converter stage provides level control and ramp control.

9. The apparatus of Claim 2, wherein the linear regulator stage provides ramp control and level control.

10. The apparatus of Claim 2, further comprising means for receiving said control signal and in response thereto producing a first control signal for the switch-mode converter stage and a second control signal for the linear regulator stage.

11. The apparatus of Claim 2, further comprising a magnitude driver responsive to a modulation signal for producing a first control signal for the switch-mode converter stage and a second control signal for the linear regulator stage.

12. The apparatus of Claim 2, further comprising means responsive to a phase control signal for generating a carrier signal having a phase modulation characteristic, the carrier signal being applied to the RF power amplifier.

13. The apparatus of Claim 12, wherein the modulation signal is a magnitude control signal, and the RF signal is amplitude modulated.

14. The apparatus of Claim 13, further comprising a modulation encoder responsive to a data signal for generating the magnitude control signal and the phase control signal.

15. The apparatus of Claim 14, wherein the modulation encoder operates in a polar coordinate system.

16. The apparatus of Claim 2, further comprising:

a plurality of amplifier modules, each amplifier module comprising:

a switch mode converter having a power input, a power output and a control input;

a regulator having a power input, a power output and a control input, the power input of the regulator being coupled to the power output of the switch-mode converter;

a magnitude driver responsive to a modulation signal for producing a first control signal coupled to the control input of the switch mode converter and a second control signal coupled to the control input of the regulator; and

an RF power amplifier having a non-linear operational mode, a power output of the regulator supplying a operating voltage of the RF power amplifier;

an RF signal applied in common to all of the RF power amplifiers;

and

a magnitude driver responsive to an overall magnitude signal for generating one or more magnitude drive signals, a magnitude drive signal being applied to each of the RF power amplifiers.

17. The apparatus of Claim 16, wherein a separate respective magnitude drive signals are generated for each of the RF power amplifiers.

18. The apparatus of Claim 16, wherein a single magnitude drive signal is applied in common to all of the RF power amplifiers.

19. A method of controlling a power amplifier, comprising:
generating a specified voltage in accordance with a control signal
for performing at least one of level control, burst control, and modulation;
applying the specified voltage to a power amplifier as a supply voltage of a final amplification stage of the power amplifier; and
repeatedly driving the final amplification stage between two states, a hard-on state and a hard-off state, without operating the amplifier in a linear operating region for an appreciable percentage of time;
wherein the amplifier is controlled without continuous or frequent feedback adjustment.

20. The method of Claim 19, further comprising applying an RF input signal to the RF amplifier, wherein the RF input signal is phase modulated.

21. The method of Claim 20, further comprising;
encoding data in polar coordinates to produce a magnitude signal and a phase signal; and
generating the RF input signal in accordance with the phase signal;
wherein said modulation signal is derived from said magnitude signal.